Strategic Trade and protectionism Theories and Empirics
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Lecture - 09
Static to Dynamic Comparative Advantage Theory

Welcome to NPTEL module on Strategic Trade and protectionism Theories and Empirics, we are on the second week of this particular you know MOOC course. Where we are discussing on the theories, classical theories of international trade, especially you know Adam Smith theory to do you know the Ricardian model of international trade. Where we have been trying to understand in the couple of lectures back, where how you know the Adam Smith theory or even before that, how mercantilism has been actually criticized. Because of many redundant or because of many fact, assumptions they consider which are quite unrealistic in nature.

In this connection, I feel you know we are supposed to understand in a differ format, we should actually imbibe certainly you know realistic assumptions of the model; even if it is classical phase, their assumptions are different, their situations are different, what we must understand it very differently based on the modern thinking of the classical theory. So, myself Dr. Pratap Chandra Mohanty faculty member of IIT, Roorkee attached with the Department of Humanities and Social Science.

So, this module number 9 we will talk about this particular lecture number 9, we will further deep down to the understanding of static to dynamic competitive advantage theory. We know that comparative advantage theory initially proposed by David Ricardo in 1817 and we again let me mention that Ricardo is in fact, it I mean was in fact, a theorist as well he was also a parliamentarian, also at trader, who believes strongly on abolition of Corn laws; which I discussed in the you know week number 1.

And, how you should prepare for the exam in between as well, if I mean how should derive contents out of it, please try to look at the slides and its points very carefully. If you do not do

that probably you know some of the questions largely the questions will frame, from the PPTs and the content on the or the textbook I have suggested in my first week of the module.

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So, to have a deeper understanding, always all the slides have been connected like; you know first week slide connected to the second week slide. Now, suppose I am explaining David Ricardo and its contributions to us in a comparative cost advantage, we must also simultaneously try to understand how David Ricardo is actually famous and what are the evolution of the theory is still you know a David Ricardo?

So, make it very clear you know, you know receiving the fact before David Ricardo. So, let me explain since we did not explain the assumptions categorically in the last lecture for David Ricardo and its comparative cost advantage, in this particular you know PPT or in this particular lecture, we will talk about even in detail about how classical theory or the

comparative cost advantage theories interpreted in terms of, in terms of static to dynamic format over a you know period of time by including various other factors.

So, now, let us go by the strict assumptions which was made by David Ricardo. First assumption there are several strict assumptions in fact, first assumption was fixed endowment of resources. The resources must be actually you know must be fixed or you know has a clear limit, if it keeps on changing if it keeps on changing then probably it will very difficult to you know model it.

And, that to the resources the type of products being exchanged or the trade is being discussed, must have had homogeneity in the products. For example, if x were discussing that must be identical, in all the countries. Otherwise you know the qualitatively if things are different then some country might defer in exchanging their product. And, factors of productions factors here are completely mobile between alternate uses within a country.

So, mark it very carefully. So, the factors are mobile within the country not outside and that to mobility for you know they are used across the you know manufacturing units or across the industries, but not across the country, that is very very important to develop the theory. The next to the understanding of classical or specially Ricardian comparative cost advantage theory, we should also understand factors of production are completely mobile externally which I said and they are theories based on labor and the unit of measurement of all the products for their evaluation was through labor.

So, labor is considered is the value for a particular part product. Similarly, the level of technology is also fixed in both the countries, had it been the case that technology is actually different then do not you think it is going to be problematic. Because, it adds you know number of other possible you know economizing the production function, it might you know reduce the cost of the product and it has you know differentiation in terms of quality of product so, therefore, technology it will be inspire things differently. Then some other you know strict assumptions are the following as well; unit cost of productions are constant.

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So, cost of production the unit change in the cost of production is constant so, they believe in constant production function. So, basically; the you know marginal productivity off of I mean , if I just try to understand in two factors, if there are L1, L2. So, this has to be change of this one has to be constant throughout the production function. And, can and if again if I try to also interpret in terms of two products so, d X1 divided by d X2 should be also constant.

So, in terms of production function also assumed to be constant, here we are going to derive a constant production function. So, no question of non-linearity, it has a linear production function. So, we will discuss in the next slide. So, there must be full employment since resources we have limited and fixed and identical resources so, they also assume full employment and classical largely believe on the fact that all the resources are fully employed.

So, therefore, you know less intervention has been or was prescribed, during that period and now, perfect competition in factor market as well as product market, factor market and product market because perfect competition ensures the price of the product to be constant and which is set as a minimum most level equivalent to the level of marginal cost. And so, therefore, the exporters or the manufacturer or the traders across that know different industries, different categories of goods will not find difference in exchange a product so, far as the price is concerned or other forms of computation is concerned.

So, they assume that the market must be perfectly competitive. And, and that to competition you know prevailed in the economy again stem to the reasons of no intervention, no intervention it is the free flow of the market which actually guides and boils down the market to be very competitive. So, no government imposed as I told mention already imposed obstacles to economic activity, then internal or external transportation and external transpiration cost are also 0.

I have already mentioned this point very specifically while we explain this theory. Now, they developed the theory as a 2 by 2 by 1 framework so, basically 2 country and 2 cumulative world and 1 stands for 1 factor production that is labor. So, these are broadly some of the very important assumptions of classical theory and specially by David Ricardo. So, let me just put you across to you suppose, I may be making you confuse in the question.

I may asked you write down you know two important assumptions which are related to the product we know as assumed in the classical theory. So, out of so many assumptions product may be I mean it should be identical, then product you know it follows a competitive market model. And, if you wish to add you know further you know, if you are to for the specific related to product and also assume that it follows a constant it has to scale production function, ok.

And, and the production function is linear then I have already also said you know there is you know, the prices of the product due to the competitive you know market structure led to more or less you know price to be fixed and that say it is at a very minimum level equivalent to a

marginal cost. And, those are the things you might have read in microeconomics. So, no need to attach for the clarifications of why this equivalent to marginal cost? So, with strict assumptions or with strict assumptions are replaced with more you know realistic ones in the modern theories.

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Now, since we are trying to map the transition or the you know arguments behind static to dynamic models or comparative cost advantage now, so, the those strict assumptions are actually replaced with some realistic ones in the modern theories, there is one of the major difference. So, now, the immediate you know theory which is usually referred as a modern you know theory of internal trade by none other than Heckscher and Ohlin, who examined the effect of different factor endowments on international trade.

So, what in the classical we said factor endowments should be fixed and identical. Now, they are saying if they just relax one assumption and mention to the fact that if factor endowments are different, ok. If they are different and usually they are different across continues they are different do not you think so. So, each country poised with you know different quality of factors.

So, accordingly their products would be differentiated, but in this model we will read you know, you know next week lecture where we will talk about the you know specialized issues, some extent of specialization, but that led to factor price equalization; their main purpose is to talk about intensity, intensity of production and factor price equalization price equalization model. So, I will you know discuss in detail.

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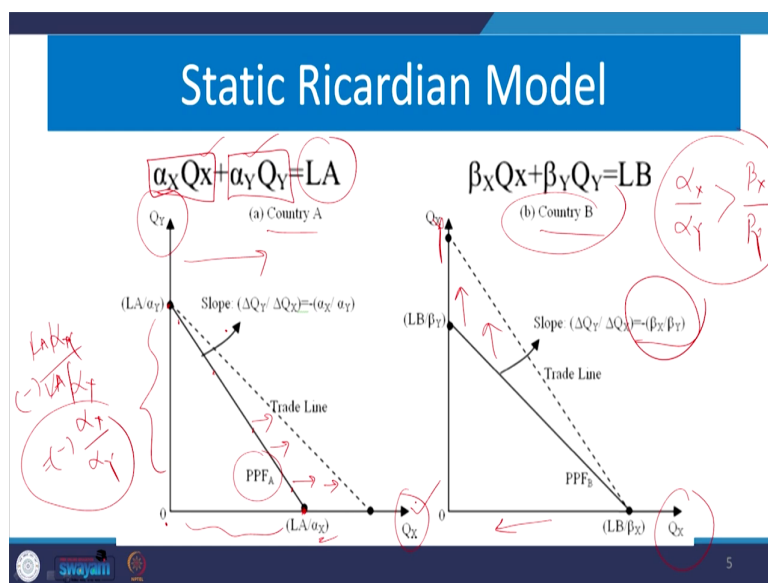
Now, revisiting the classical you know Ricardian model is considered a state static is due to the fact that, we have assumed certain you know very strict assumptions. And, let there be two countries, which has been assumed which was assumed in this model and based on that let the term total quantity produces Q X and Q Y respectively and, this is for country A and this is for country B. Now, here we are explaining with the help of their production possibility frontier which map the maximum possibly, maximum possibility of productions as generated in a economy given a time period of 1 year, keeping other thing constant.

Other things like you know so, many other you know countervailing effects must be actually, assumed to be constant otherwise it is not possible to explain. Now, since it is exhibiting a constant returns to scale function and that too the you know substitution effect is purely constant, the unit change of cost of production is constant. So, it is different it with it constant you know PPF production possibility frontier and it so, it will be linear.

Now, start with I mean how to present it. So, basically we can present it, how much maximum you know maximum amount of Q Y that can be produced? Or given the you know total budget of an economy, given the total you know labor availability in an economy in country A, now, given that the proportion at maximum could be produced will be of the price of basically so, if I divide it by the you know price of that particular enough factor, price of particular factor which is useful to produce Q X will get a maximum figure.

And, similarly, if you divided the you know price of that particular factor with another I know the out of the total resources, we can add maximum able to produce this much. If plot this two so, we will get the production possibility frontier. Now, what is this is the total I mean at maximum at the corner solution plus this is the total at maximum we can produce. If we add it so, I mean we will get you know other combinations or other combinations within the boundary and of course, those are not the corner points, because we get other combination mixed with both of the you know products that is X and Y.

So, that will be equal to alpha X plus Q X plus alpha Y into Q Y so, is equal to the total resources availability in country A. So, labor availability in country A. Then so, the slope will

be perpendicular by base, this much divided by this much. So, since this is LA divided by you know alpha you know you know alpha times X whole divided by LA by alpha times of you know X sorry the first one is alpha times of Y, we are discussing alpha time Y this is alpha times of X is here.

So, now, a LA cancels so, this will be equal to and since the slope is negative we have to write our negative so, minus of alpha times of X divided by alpha times of alpha of Y. So, this is alpha of X divided alpha of Y. So, basically this is the price ratio. So, price of X at maximum, how much you know X can be produced and the price of you know Y or the factor prices which are used for Y it maximum Y can we produce, if you take it is basically the prices of; prices of not the product prices into the factor prices.

So, this gives the price ratio of the factors, which are dedicatedly use for X and Y. Now, based on that we derive a production possibility frontier of country X similarly, you can derive the you know slope of the country Y. Now, country Y accordingly or its county B accordingly, here we said country A and here it is country B. Now, you are I mean after plotting their respective production possibility frontier, we can you know in for something out of it.

Now, the slope here in the first one is higher; that means, you know just absolute value of the slope or the non-negative value of the slope Y which is actually greater than that of beta of X divided beta of Y, isn't it. So, in this case the relative price of X is higher than that are relative; X in country A is higher than the that of country B. Now, since the relative prices of country A price of A X is country A country A is higher.
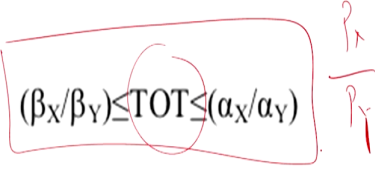
So, it can be inferred comparatively country A has advantage in production of, in production of community Y. Whereas, the relative price of you know X is comparatively low lower or lesser in country B. So, the country B; relatively emphasized or specialize in the production of X. So, what will happen after trade? The country A will export you know Y and country B will export X.

So, there will be mutual beneficial trade, based on the trade the country A can able to add more of X given though Y gets exported so, country you know country similarly, country B can able to add to its basket of commodity Y from another country. So, this would be from another country this would be Y, this would not be X, ok. So, this is X this is y so, accordingly we can define the mutual beneficial trade.

So, therefore, since both are gaining so, there is a possibility of trade and trade is mutually beneficial. This is what is observed in the very static Ricardian model, and the static Ricardian model you know, because static only because of the fact that we considered a number of strict assumptions specially the production and function.

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Now, over the time period what really happens, you know people are going to or other you know models let us try to understand the you know the maximum range of trade. And, the

range of trade is defined by their slope and we know that this is lesser than that of these and it is their price line also price line of their product. So, product price lines are also given here, since we are explaining the you know production possibility frontier so, the you know so, the range will be defined accordingly.

So, range is defined as this is lower, lowest one, this is the highest one so, the terms of trade which is largely defined as price X by price of Y is actually interpreted like this so, accordingly the range of trade is defined. And within that the possibility of trades are, are taken place.

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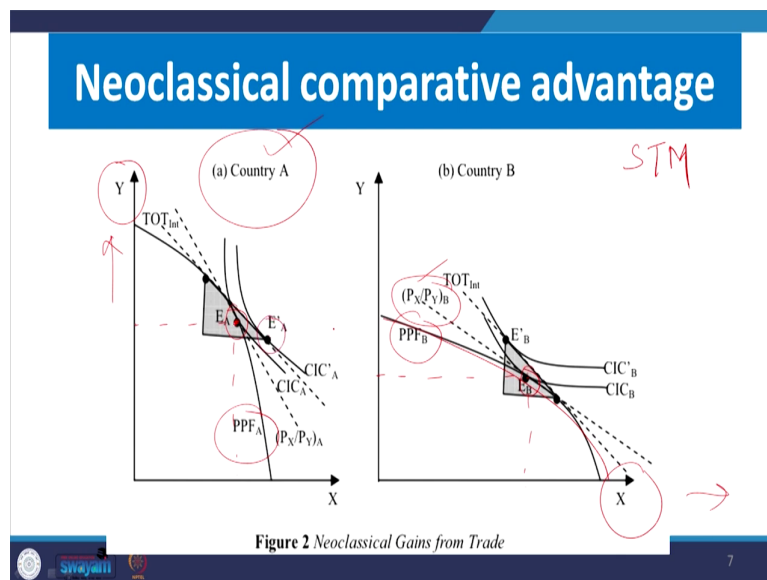
Now, if you go a little ahead with the discussion of neoclassical you know comparative advantage since we are emphasizing comparative advantage so, let us interpret in a new classical format, where we will be taking the help of production function for sure. Now, the

production function is a assumed as a neoclassical framework is not linear and which is very realistic and the production function exhibit non-linearity, because you know every you know you know fraction of change of one factor cannot be constantly substitute another factor.

So, therefore, there are there are possibility of non-linearity in the relationship between the extent of substitution within factors and their production function as well. So, it boils down to be non-linear, the production possibility frontier for country A is non-linear, for country B here it is also non-linear. Now, what the new classical economies special in standard trade model we are going to read it in the next class in the next week also, is on standard trade model. Standard trade model where the very assumptions of the production function has been relaxed and you know has been considered is quite realistic.

Now, they also go by I mean its not just production that matters and also matters; how the country also consume how much they possess with their own endowments let be the initial endowment will be at E A and in contribute as E B. So, based on the community indifference you know curve CIC stands for Community Indifference Curve, where it represents a general you know demand function of the total consumption function for country A and country B respectively. So, given this fact will end off with their domestic consumption and whatever is left, they can go for export or import respectively.

Now, from here it seems as if the country now, if you look at these country B is more end out towards the production of X even we start with our assumption in the first static model as well. Now, in country A they are a relatively endowed with you know more of country Y, because the curve is largely tilt towards y and here it is largely tilt towards X. So, accordingly so, the country will specialize and if you take the price line or the you know, the relative prices of the product so, this will be now, look at the slope of slope at the point of their endowment so, and here.
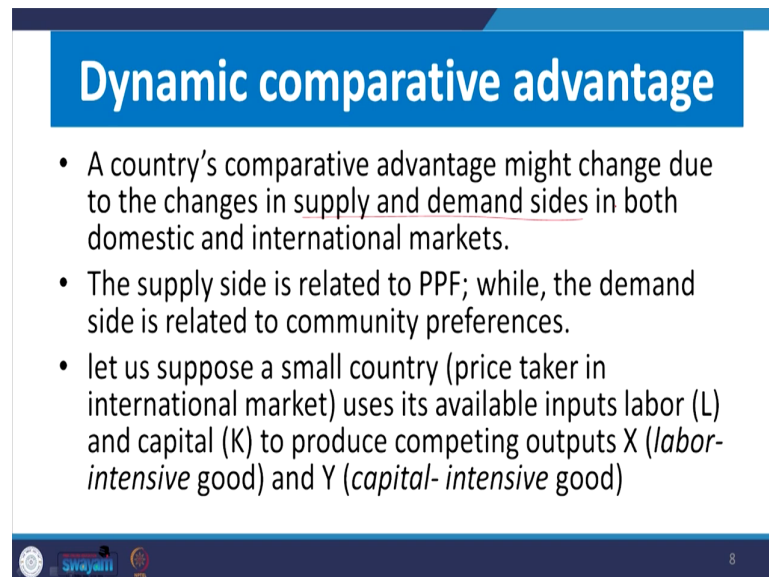
So, now, it is more deeper in any country it is more deeper and it is, is this is actually less deeper serenity prices of X in country A is higher, relative prices in country B is lesser. So, therefore, there will be mutual possible trade and given subject to the condition that they are consuming you know, you know accordingly; if they are over consuming then that of their

domestic you know availability or the endowment. So, they may depend on you know further import of the same variety even if they have more endowment.

So, that is another flip side of the problem and flip side of the problem, because and that is identified by the modern economists especially, modern economy specially the neoclassical economists and, and accordingly they settle their trade in different format. Now, let us move to the further adjustment; now, here they will land off depending upon their you know shift. Why shift is their? Because after trade there will be possibility of settling down with higher no benefits, because you know trade is mutually beneficial.

So, dynamic comparative advantage you know the countries comparative advantage might change due to the change in supply and demand side as I just said in both domestic as well as international markets.

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Dynamic comparative advantage

- A country's comparative advantage might change due to the changes in supply and demand sides in both domestic and international markets.
- The supply side is related to PPF; while, the demand side is related to community preferences.
- let us suppose a small country (price taker in international market) uses its available inputs labor (L) and capital (K) to produce competing outputs X (*labor-intensive* good) and Y (*capital- intensive* good)

So, what we try to compare here? The simple neoclassical framework largely emphasize, you know a departure from static as the production function exhibit constant turns to scale to a non-linear production structure. And, from there they emphasize on the domestic you know equilibrium level and given the fact that what the another country could able to you know settling with their you know domestic a level of you know consumption and production.

Now, in the dynamic one especially in the new classical framework itself; that they also try to emphasize the change, the transitions from one point to a final settlement point, we try to discuss that. Now, the supply side is now, they you know the supply side related to PPF while the demand side we already discussed this. So, let us suppose a small country a price taker in international market, uses its available inputs labour and capital produce computing goods and X and Y. And, X is labor intensive and Y is capital intensive. Now, we are emphasizing to an extent of the model called Heckscher Ohlin theory.

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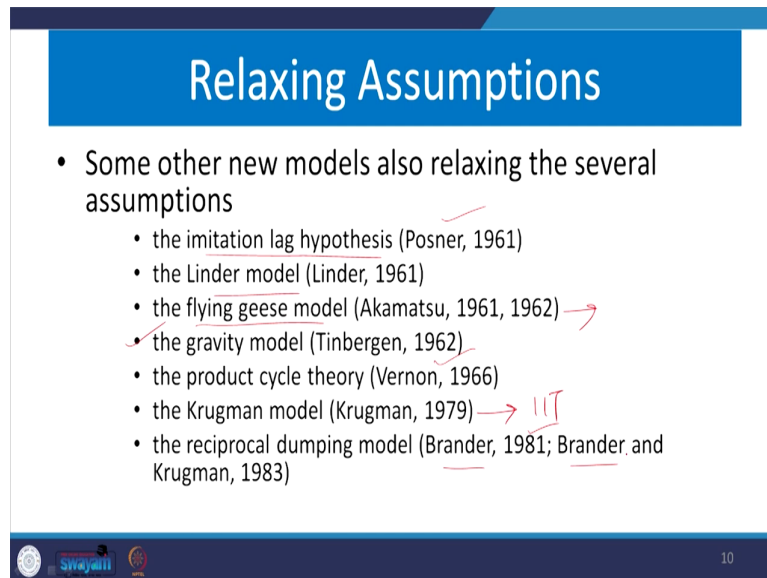
Figure 3 Equilibriums in Production and Consumption

We will discuss in detail in the next week and where the intensity of production is discussed now, in this framework the transition effect is emphasized. So, whether X and Y we have already said is the labor intensive capital intensive based on their PPF. So, given the fact that you know a product is being actually, demanded internally and externally and their domestic and external demand. So, that may lead to you know lead to different set of if and only if they have different consumption function.

If the consumption function is settled or is being demanding a different level then they might be net importer even if they are producing more. So, this transition effect is emphasized by the other new classical models so, transition effect might be there depending on the consumption effect. So, we will discuss in detail at this moment I am just mentioning the movement from A to B. And, since we are emphasizing equilibrium in production and consumption function, we will take the help of you know upper coverage well you know

other class to explain the exact translation effect or and to emphasize the dynamic comparative advantage.

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So, therefore, the new classical model or the you know is actually based on relaxing assumptions so, some other new models also relaxing the several assumption we will discuss; some of the other models like; imitation lag hypothesis by Posner, Linder model basically on overlapping demand model. Flying geese model we will discuss in the next you know next lecture based on (Refer Time: 29:52) economic you know experiences. Gravity model who has specialization of a particular product, based on their you know geographic location we will we also discussed.

So, product cycle theory by Vernon how over the time cyclically changes takes place and, define the trade. Krugman model where we emphasizing on the you know economy of scale
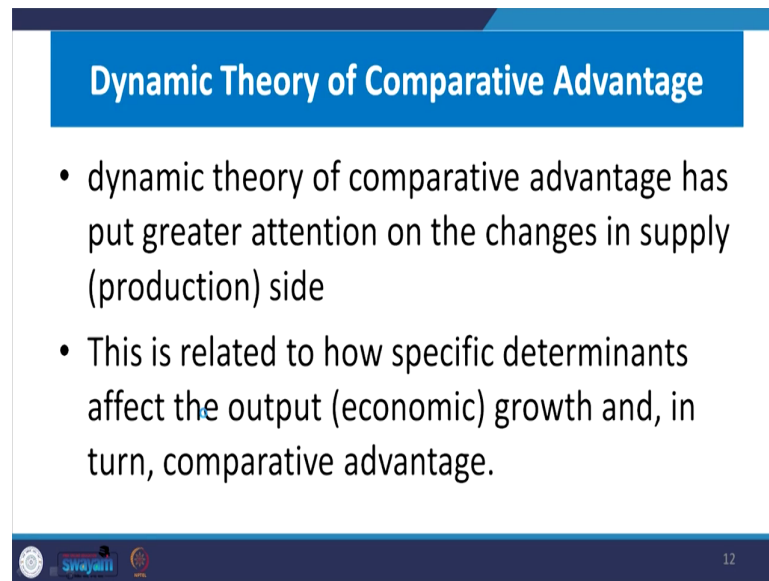
of production and its consequences in terms of quality of the product and where we will be emphasizing inter industry trade and inter industry trade discussions. Similarly, reciprocal dumping model by Brander in 81 paper Brander and Krugman (Refer Time: 30:31) 83 are also important.

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And, similarly, what is new then those all models are actually not negating the you know comparative cost advantage. So, they have not reduced the popularity of the comparative or rather they have relaxed on the assumption and explained the comparative cost advantage. Some economists argue that country is comparative advantage is dynamic instead of this is not I mean not starting at all, it is actually dynamic.

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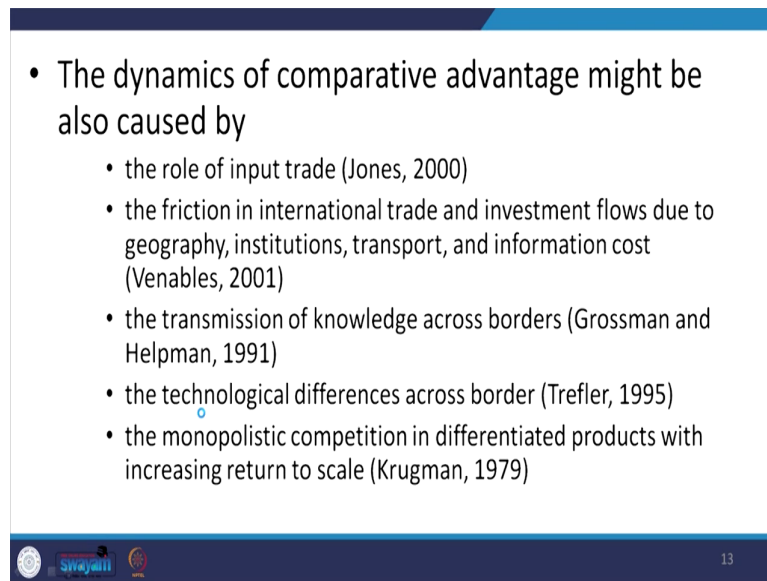
Now so, given this fact we will actually discuss many things, you know based on those you know relaxation of assumptions in next lectures.
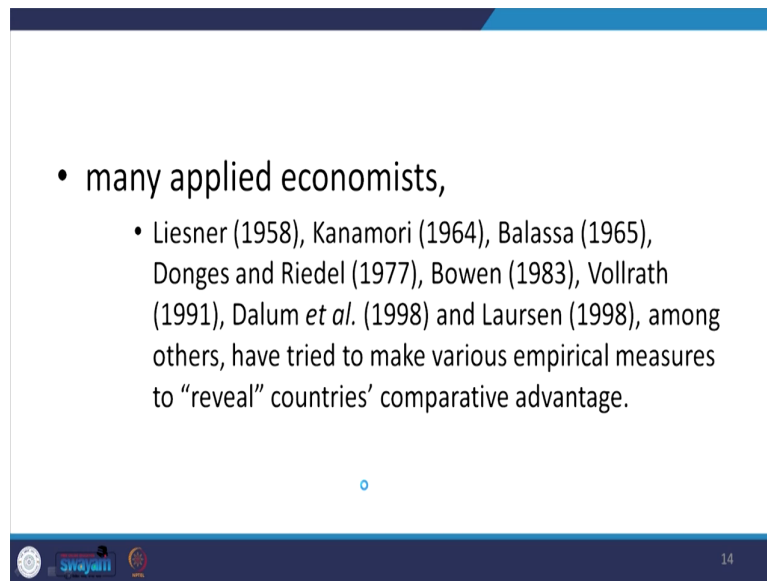
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Similarly, other factors as I told you like you know role of input matters, friction international trade matters, transmission knowledge across borders matters, technological difference across borders really matters. So, monopolistic competition in differentiated products with increasing returns to scale also matters we will discuss in detail, we will take off those individual sections.

Many implied economist like Liesner, Kanamori, Balassa paper are also important, some others are mentioned here you may go through.
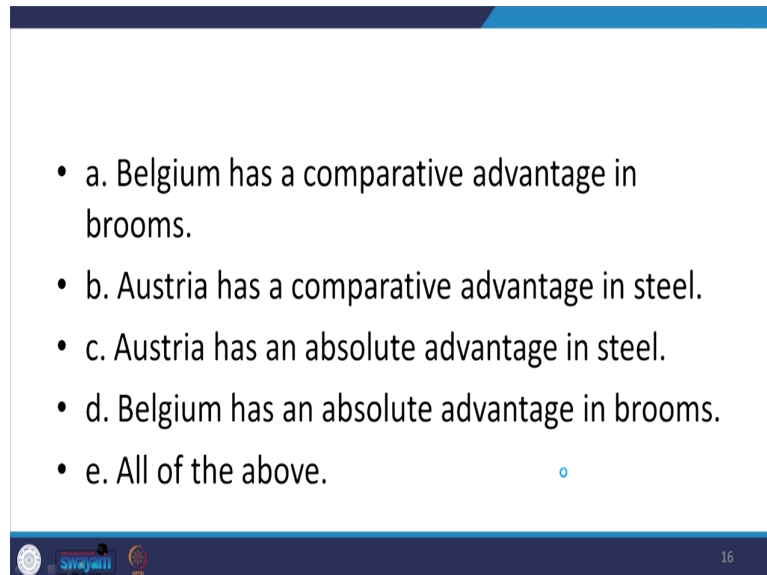
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As a sample for further you know explaining the empirics of classical or the comparative cost advantage theory, we may take an example of you know unit labor requirements in two countries; let it be Austria and Belgium. And, in the earlier example in the previous lecture we discussed productivity is the difference here; we are also discussing unit labor requirements.

How much labor is required to produce 1 unit of product? That means, here is we are presenting the cost; these are the cost of productions, unit labor requirement to produce unit of steel or brooms. Now, here the I mean we can compare the cost of production similar for steel, for steel which this is the lowest cost of production as compared to I mean Austria has lowest cost of production whereas, for broom Belgium has lowest cost of production is not it.

Now, in this case we can easily you know understand so, if it is unit labor requirement, labor requirement so, we can clarify since the less for steel lowest is here; so, for broom lowest is here. So, there will be; there will be mutual trade and specialized is defined.

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Now, based on this we can define I mean find out the answers, Belgium has a comparative advantage in brooms, Austria has a comparative advantage in steel and or not out of all these option you just go through it; you know and since these are other examples I have in the slides we will carry throughout this one to the next lecture. And, next lecture is empirical testing of the Ricardian theory and these are the slides we will carry forward to the next class in detail and in between you can think of what could be the answer; I will explain these things in detail in the next class.

Thank you.